# Clinical Practice Procedures:
## Resuscitation/Defibrillation

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# Defibrillation



**Defibrillation** is the definitive treatment for the life-threatening cardiac dysrhythmias – (VF and pulseless VT) – and is undertaken in parallel with advanced cardiac life support procedures.[1]

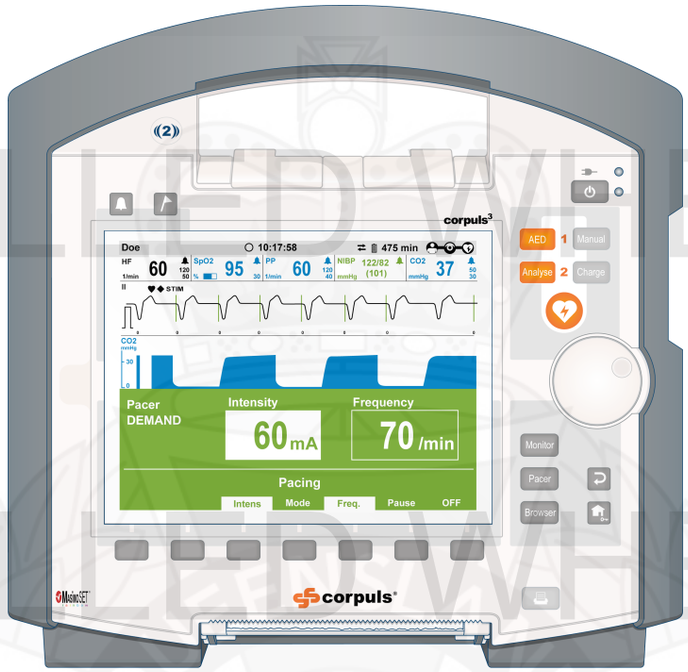
A direct current countershock when applied through the chest produces simultaneous depolarisation of a mass of myocardial cells and may enable resumption of organised electrical activity.[2]

**Depending on the type of defibrillator, shocks may be performed using:**

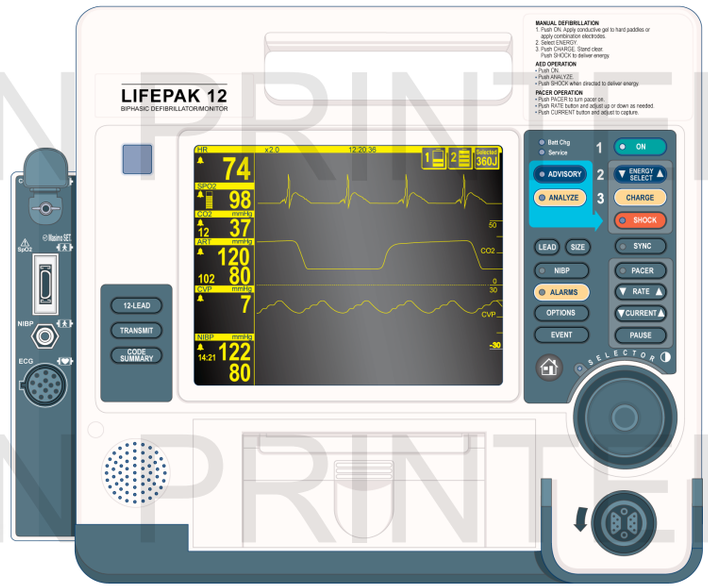
- manual mode
- semi-automatic mode

**Four types of defibrillator are utilised by the QAS:**

- corpuls3
- LIFEPAK®12
- Propaq®MD *(QAS Flight paramedics working with CareFlight Physicians)*
- HeartStart FRx *(QAS First Responders)*

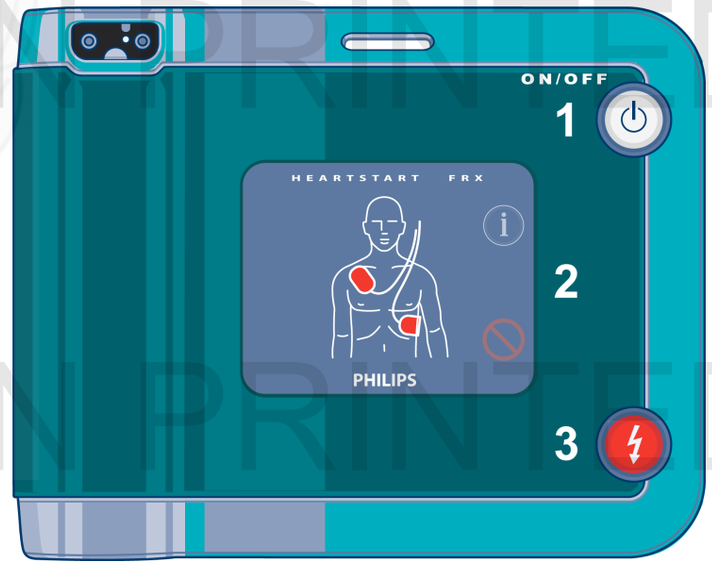



corpuls3




LIFEPAK®12

Propaq®MD




HeartStart FRx

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## Indications

- VF
- Pulseless VT

## Contraindications

- Non shockable rhythms:
  - asystole
  - pulseless electrical activity
  - perfusing rhythms
- Patients presenting with signs of life

## Complications

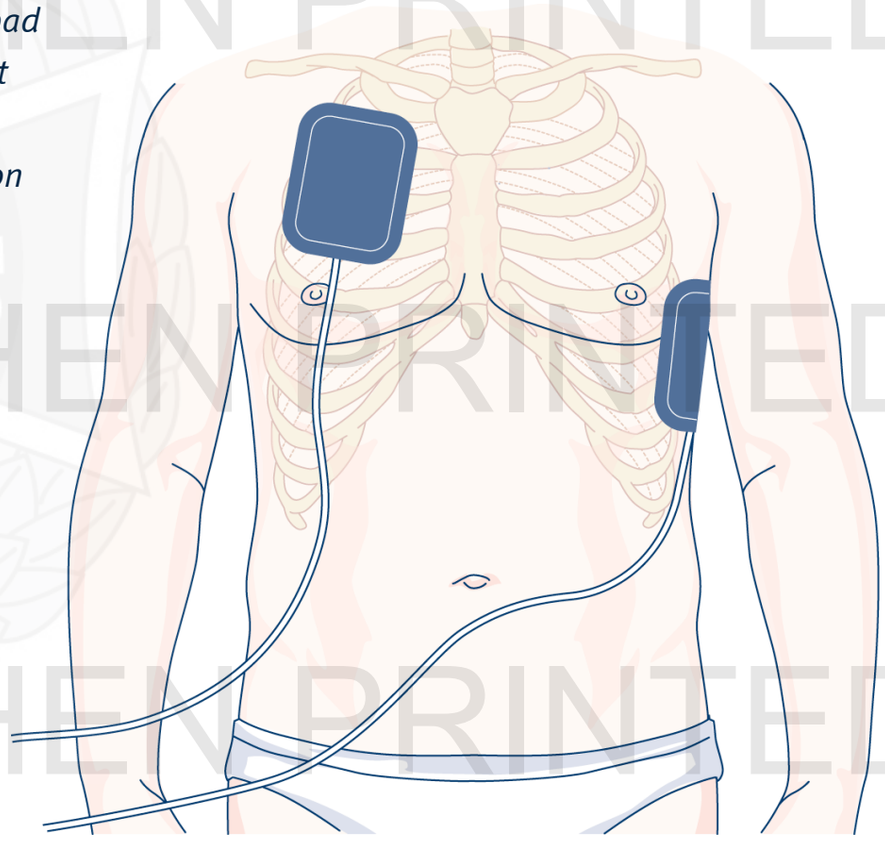
- Patient injury including burns:
  - Arcing between electrodes may occur if pads are incorrectly placed.[1]
  - Foreign bodies (including cardiac leads) between the pads and patient
  - Pads with insufficient lubrication[1]
- Explosion:
  - Discharge of the shock could initiate an explosion if there is a combustible gas or fluid in the vicinity.[2]
- Transmitted shock to the operator or bystanders[3]

## Procedure – Defibrillation

- Prepare the patient and skin for electrode placement *(refer to additional information)*
  - Ensure non-conductive environment
  - Ensure non-explosive environment
  - Ensure no-contact environment
  - Expose chest: shave, clean, dry area to ensure good skin contact between defibrillation pads and the skin
  - Remove monitoring electrodes if they are obstructing defibrillation pads.
- Position defibrillation electrodes in the anterior-lateral position (all patient ages). Anterior-posterior electrode placement my be considered if defibrillation electrodes are at risk of overlapping (paediatric patients).

** In females defibrillation pad placement over the breast may increase impedance and decrease defibrillation efficiency. The positive defibrillation pad should be placed lateral to, or underneath the breast tissue in large breasted women.*

***NOTE:** Authority to defibrillate in an aircraft must be obtained from the pilot prior to commencing defibrillation.*



**Anterior-lateral defibrillation pad placement**

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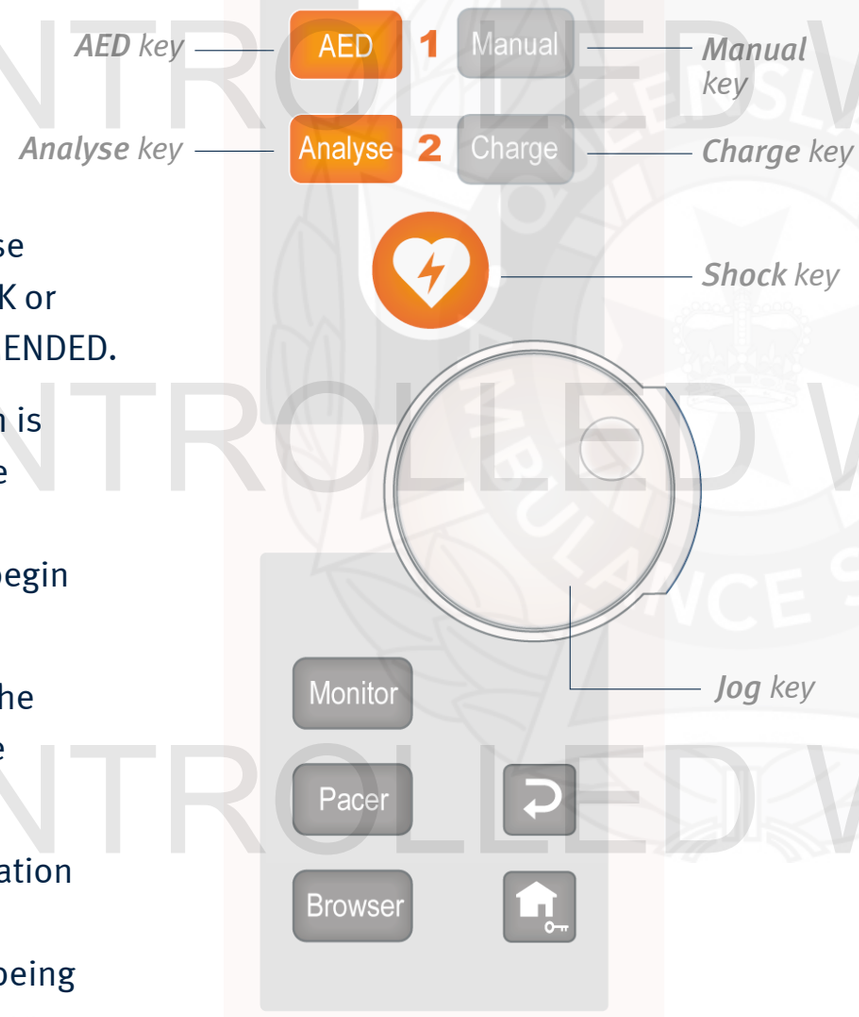
**corpuls$^3$:** ***For comprehensive instruction refer to the corpuls$^3$ operating instructions.***

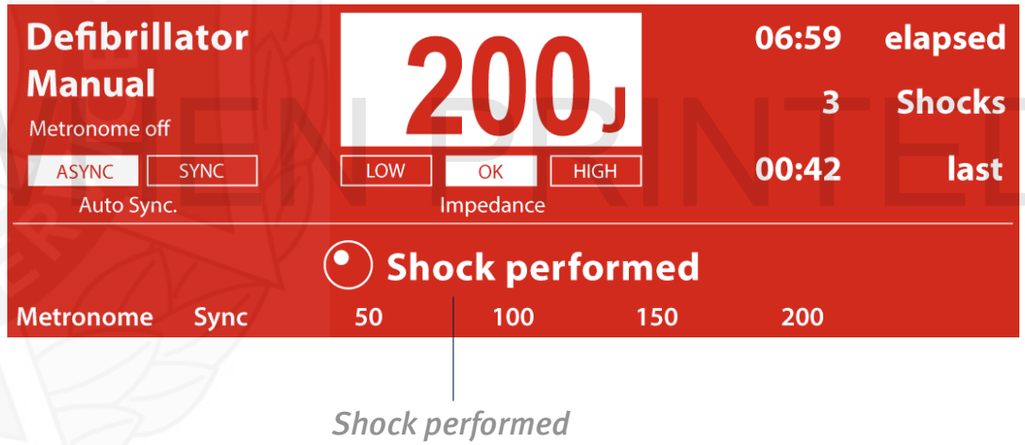
### Automatic external defibrillation (AED) mode

- To start the AED mode, press the **AED** key. To change to AED mode when the defibrillator is in manual mode, press the **AED** key.
- Attach corPatcheasy defibrillation electrodes to the patient.
- Press the **Analyse** key to initiate analysis. Do not touch or move patient.
- After analysis of the ECG the defibrillator will advise either DELIVER SHOCK or SHOCK NOT RECOMMENDED.
- If a shockable rhythm is detected, you will see DELIVER SHOCK and the defibrillator will begin charging to 200j.
- Once charged, hold the key to deliver the shock to the patient.
- Confirm that defibrillation has occurred by SHOCK PERFORMED being displayed on the screen.




### Manual external defibrillation mode

- To start in manual mode, press the **Manual** key. To change to manual mode when the defibrillator is in AED mode, press the **Manual** key.
- Select the required energy level with the flashing jog dial or via the soft keys, confirm the joule setting by pressing the jog dial.
- Press the **Charge** key to charge the defibrillator.
- Once charged, hold the key to deliver the shock to the patient.
- Confirm that defibrillation has occurred by **Shock performed** being displayed on the screen.




***NOTE:*** *If paramedics are unclear regarding the presenting cardiac rhythm the corpuls$^3$* ***Analyse*** *function should be immediately used.*

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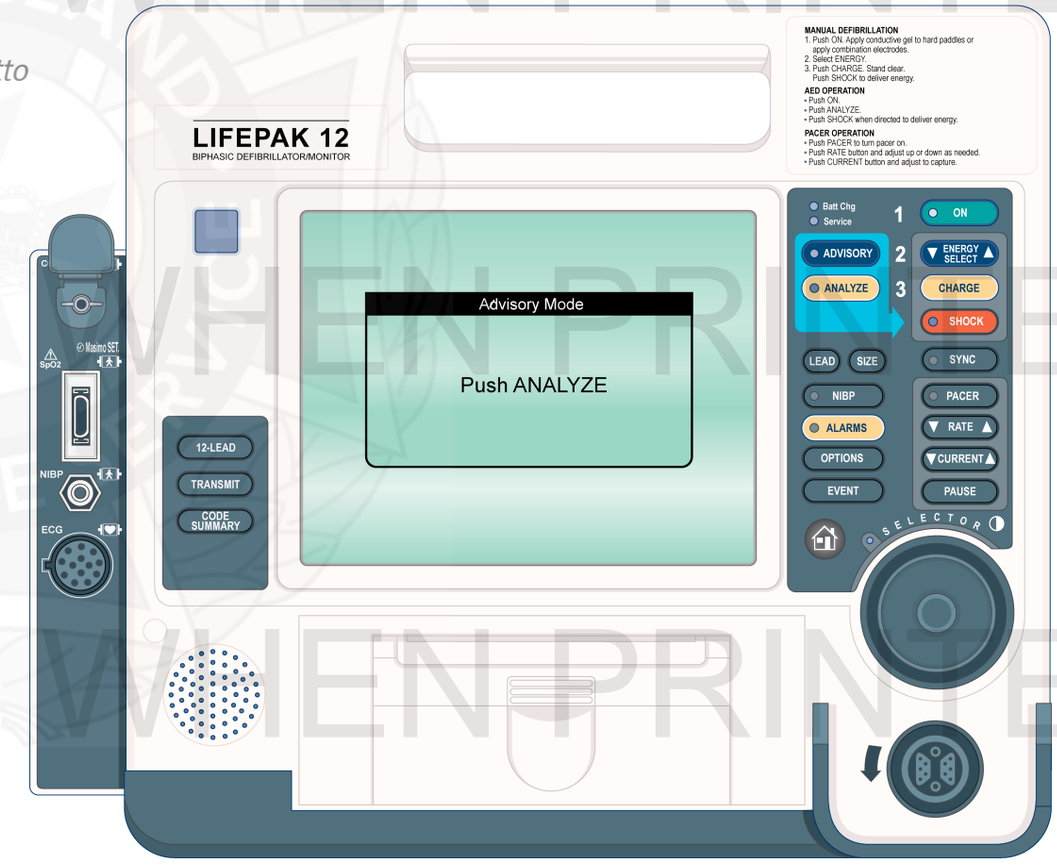
**LIFEPAK®12:** ***For comprehensive instruction refer to the LIFEPAK®12 operating instructions.***

## Semi-automatic external defibrillation (SAED) mode

- When turned on the LIFEPAK®12 will be in semi-automatic mode and the **ADVISORY LED** is illuminated.
- The **CONNECT ELECTRODES** message and voice prompts occur until the pads are connected to the therapy cable.
- Press **ANALYZE** to initiate analysis. Stop CPR.
- After analysis of the ECG the defibrillator will advise either **SHOCK ADVISED** or **NO SHOCK ADVISED**.

- If a shockable rhythm is detected, you will see and hear **SHOCK ADVISED** and the defibrillator will begin charging to 200 J. A rising tone indicates that the defibrillator is charging.
- Once charged, press **SHOCK** to deliver the shock to the patient.
- If the **SAED** detects a non-shockable rhythm you will see and hear **NO SHOCK ADVISED**.
- After a shock is delivered or no shock advised a 2 minute CPR continue timer displays on the screen.
- After 2 minutes, user is prompted to **Push ANALYZE**.

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## LIFEPAK®12 *(cont.)*

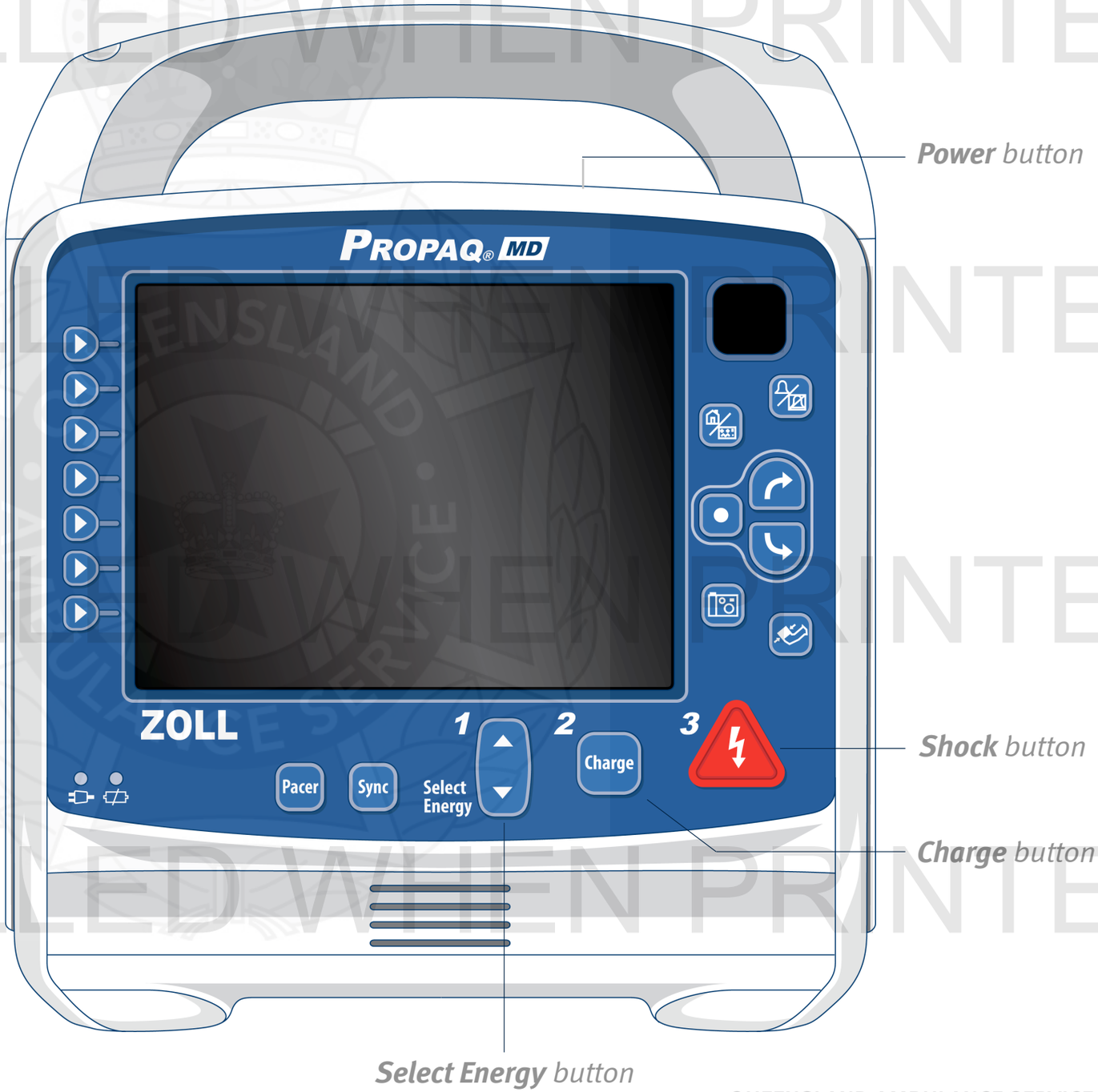
### Manual external defibrillation mode

- To change to manual mode when the defibrillator is in SAED mode, press the **Advisory** button.
- Press **Energy Select** and dial the appropriate energy setting.
- Press **Charge** to charge the defibrillator – a rising tone indicates that the defibrillator is charging.
- Press the **Shock** button to deliver the shock to the patient.

***NOTE:*** *If paramedics are unclear regarding the presenting cardiac rhythm the LIFEPAK®12 ANALYSE function should be immediately used.*

## Propaq®MD:

***For comprehensive instructions refer to the Propaq®MD operating instructions.***[5]

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## Manual external defibrillation mode

- Press the green power button to turn the unit on.
- If defibrillation electrodes are not making good contact with the patient's skin and the pad selection is ECG lead, the unit issues the message **Check Therapy Electrodes**.
- Press the **Select Energy** arrows up or down to desired level *(refer to CareFlight Physician for joule settings)*.
- Press **Charge** to charge the defibrillator – a charging message displays at the bottom of the screen, and a distinctive charging tone sounds indicating that the unit is charging.
- Press and hold the red shock button to deliver the shock.

***NOTE:*** *If paramedics are unclear regarding the presenting cardiac rhythm the Propaq®MD ANALYSE function should be immediately used.*

***Charge*** *button*

***Select Energy*** *button*

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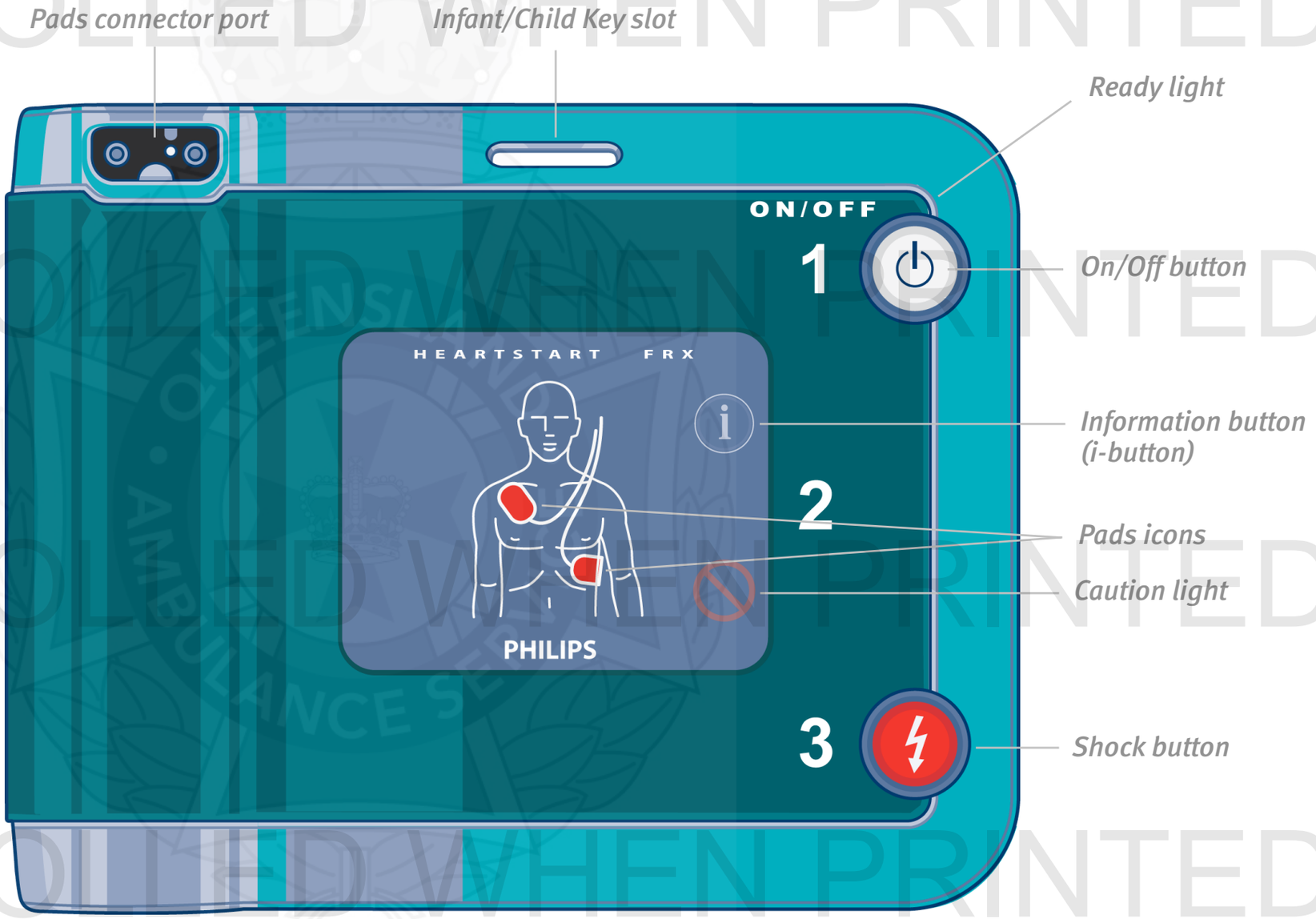
## HeartStart FRx:

***For comprehensive instruction refer to the HeartStart FRx operating instructions.***[6]

- Press the green on/off button.
- Follow the voice and visual instructions to position the pads.
- As soon as the HeartStart FRx detects the pads are attached to the patient, it begins analysing the rhythm.
- If a shock is advised the orange **SHOCK** button flashes and the HeartStart FRx instructs you to press the flashing orange button.
- If a shock is not advised, the blue i-button comes on solid, to show that it is safe to touch the patient and the HeartStart FRx instructs you to perform CPR.
- Once a shock is delivered the HeartStart will instruct you it is safe to touch the patient and to begin CPR.

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## Additional information

- The use of self-adhesive defibrillation pads is associated with a significantly improved rate of ROSC and hospital admission when compared with hand-held paddles.[2]
- After completion of a risk/benefit analysis, the QAS authorises the use of adult LIFEPAK®12 defibrillation pads in the anterior/posterior placement for paediatric patients, despite manufacturer's recommendation. The QAS does **not** stock paediatric LIFEPAK®12 defibrillation pads.
- LIFEPAK®12 joule settings for adults and children > 8 years:
  - Shock 1 200J
  - Shock 2 300J
  - Shock 3 360J
- corpuls3 joule settings for adults and children > 8 years is 200j (all shocks).
- Joule settings for children ≤ 8 years:
  - All shocks at 4j/kg
  - Round up the energy required to the next highest setting on the defibrillator.

***Safety:***

- Ensure a non-conductive environment
  - Remove conductive items in the vicinity of the patient AND/OR the defibrillator
  - Wipe the chest dry of water, sweat, blood, excess gel, vomit etc.

***Ensure a non-explosive environment:***

- Do not defibrillate in the vicinity of petrol, LPG, or other such flammable materials.

***Ensure no contact:***

- No person is to be in contact with the patient at time of defibrillation.
- Have only one clinician responsible for defibrillation. They are to check no contact and shout loudly *'All clear!'* prior to defibrillation.
- Ensure there is no contact between the patient and the ambulance vehicle prior to defibrillation. (Place blankets over side arms of stretcher and pillows under the feet if necessary.)

***Ensure no movement:***

- Rhythm analysis may be improved by stopping the ambulance where appropriate.
- Minimise patient movement.

***NOTE***: *Authority to defibrillate in an aircraft must be obtained from the pilot prior to commencing defibrillation.*

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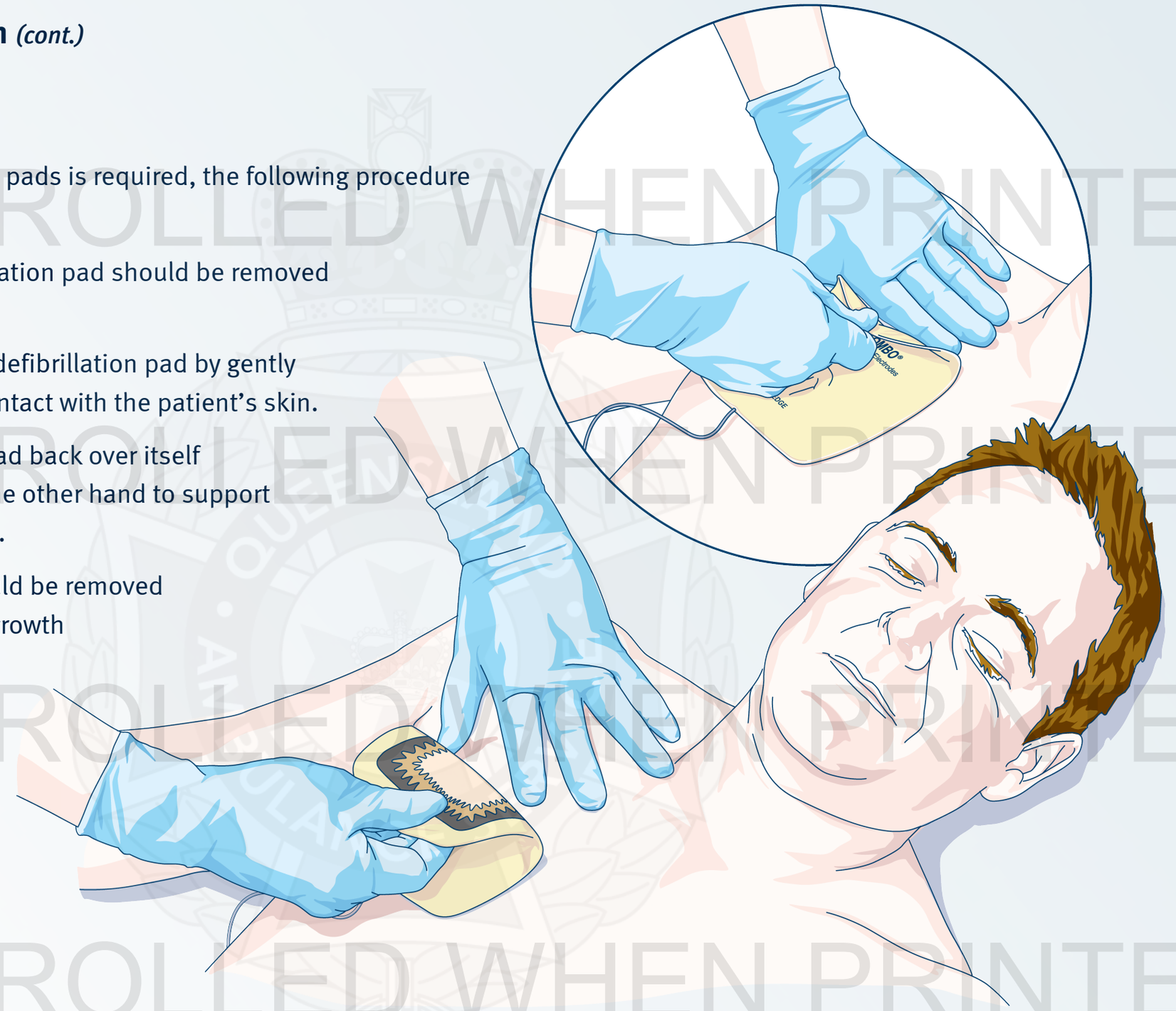
## Additional information *(cont.)*

### *Defibrillation pad removal*

- If ***removal*** of the defibrillation pads is required, the following procedure is to be utilised:
    - Each individual defibrillation pad should be removed with two hands.
    - Loosen one side of the defibrillation pad by gently separating the pad's contact with the patient's skin.
    - Peel the defibrillation pad back over itself at 180 degrees, using the other hand to support the skin where required.
    - Defibrillation pads should be removed in the direction of hair growth where possible.
    - Gentle handling of patient's skin is required in the very young, elderly and in patients where skin integrity is questionable.

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